



INSTRUCTIONS FOR USE



BuckyDiagnost TH2/TF

P a t i e n t t a b l e s

Release 5

English

Instructions for Use

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DMC GmbH
Roentgenstrasse 24
D-22335 Hamburg, Germany

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1.1 Normal Use

The BuckyDiagnost TH2 and the BuckyDiagnost TF are patient tables for supporting and positioning a patient in the radiation field of a Bucky system.

1.2 Prohibited Use

For reasons of safety two patients must not remain in the examination room at the same time.

1.3 Version

This version of the Instructions for Use corresponds to the latest version of the X-ray equipment at the time of going to press.

This X-ray equipment is available in various configurations. These Instructions for Use describe the largest possible configuration. It is therefore possible that functions (indicated as optional) are described which do not form part of your unit.

1.4 For safe operation

- If the user wishes to connect the X-ray equipment to other equipment, components or assemblies and if it is not apparent from the technical data whether it can be safely combined with such equipment, components or assemblies, the user must ensure that the safety of the patient, operating staff and the environment is not affected by the planned combination by consulting the manufacturers involved or by making enquiries from an expert.
- Philips is responsible for the safety features of its products only if maintenance, repairs and modifications have been performed by Philips or by persons explicitly authorised to do so by Philips.
- As with any technical appliance, this equipment requires not only correct operation but also regular, competent maintenance and care, which are described in the section "Maintenance".
- If you operate the X-ray equipment incorrectly or if the user fails to have maintenance carried out properly, Philips cannot be held liable for any malfunctions, damage or injuries.
- Safety circuits must be neither removed nor modified.
- You may remove or open parts of the housing only if you are instructed to do so in this manual.

1.5 Conformity



This Medical Device meets the provisions of the Medical Device Directive MDD 93/42 EEC (93).

If you have further questions regarding the applicable national or international standards, please address them to:

Philips Medical Systems DMC GmbH
Quality Assurance Department
Roentgenstrasse 24
D-22335 Hamburg
Fax: (+49) 40/5078-2147

1.6 Training

The X-ray equipment may only be operated by persons who have the necessary expertise in radiation protection or knowledge of radiation protection and who have been instructed in how to operate the X-ray equipment.

2 Safety

2.1 About this manual

This manual is intended to enable you to work safely with the X-ray equipment described. You may only use this equipment in compliance with the safety instructions in this manual and not for purposes other than those for which it is intended.

It is always the user who is responsible for complying with the regulations which apply to the setting up and operation of X-ray equipment.

The BuckyDiagnost TH 2/TF is part of an X-ray system. If there is any interaction with other components of the system, these Instructions for Use contain extracts from other manuals. You will find further information in the manual of the relevant component.

2.2 Electrical safety

This X-ray equipment meets the safety class I and type B according to IEC 60601-1.

Only trained maintenance staff may remove the covers from the high-voltage cable of the X-ray tube assembly and the high-voltage generator.

This X-ray equipment may only be operated in medical rooms which meet IEC requirements.



- ***You must never operate this X-ray equipment in areas where there is a risk of explosion.***
- ***Detergents and disinfectants, including those used on patients, may create explosive mixtures of gases. Please observe the relevant regulations.***

2.3 Mechanical safety



- ***Please ensure that neither the patient nor yourself allows hands to enter the radius of movement of the X-ray equipment and that no parts of clothing are caught by it.***
- ***Remove all objects from the radius of movement of the X-ray equipment.***

2.4

Electromagnetic compatibility (EMC)

In accordance with its intended use, this electronic apparatus complies with the law governing EMC, which defines the permitted emission levels from electronic equipment and its required immunity against electromagnetic fields.

Nevertheless, it is not possible to exclude with absolute certainty the possibility that radio signals from high-frequency transmitters, e.g. mobile phones or similar mobile radio equipment, which themselves conform to the EMC regulations, may influence the proper functioning of electromedical apparatus if such equipment is operated in close proximity and with relatively high transmitting power. Therefore, operation of such radio equipment in the immediate vicinity of electronically controlled medical apparatus should be avoided to eliminate any risk of interference.

Explanation:

Electronic apparatus that satisfies the EMC requirements is designed so that under normal conditions there is no risk of malfunction caused by electromagnetic interference. However, in the case of radio signals from high-frequency transmitters with a relatively high transmitting power, the risk of electromagnetic incompatibility when operated in close proximity to electronic apparatus cannot be totally ruled out.

In unusual circumstances unintended functions of the apparatus could be initiated, possibly giving rise to undesirable risks for the patient or user.

For this reason, all kinds of transmission with mobile radio equipment should be avoided. This also applies when the apparatus is in "standby" mode.

Mobile telephones must be **switched off** in designated problem zones.



2.5

Radiation protection



- **Ensure that before performing any radiography all the necessary radiation precautions have been taken.**
- **Personnel in the examination room must comply with the valid radiation protection regulations when using X-rays. Please comply with the following rules:**
- **To protect the patient against radiation always use radiation protection accessories in addition to devices which are fitted to the X-ray equipment (e.g. diaphragm, spacer, filter).**
- **Wear protective clothing. Radiation protection aprons with a lead equivalent of 0.35 mm attenuate X-radiation at 50 kV by 99.84%, and at 100 kV by 91.2%.**

- *Distance is the most effective radiation protection. Keep as large a distance as possible away from the object exposed and the X-ray tube assembly. Scattered radiation is largely dependent on the volume of the object being exposed.*
- *Wear a personal dosimeter. Philips recommends determining the personal dose occurring at the workplace under practical conditions and, where required, laying down any necessary radiation precautions, specifying the use of bar and/or finger-ring dosimeters in addition.*
- *Always select a focal spot to skin distance as long as possible to keep the absorbed dose for the patient as low as could reasonably be possible.*
- *Always be aware that any material brought into the path of radiation between the patient and the image receptor (e.g. film) will have a negative influence on the image quality as well as on the patient dose.*
- *Always make sure that acoustic and visual communication between operator and patient is guaranteed also during exposure. If necessary, communication must be established with technical means, for instance, an intercom.*
- *Safety circuits which may prevent X-radiation from being switched on under certain conditions may be neither removed nor modified.*

2.6 Disposal

Philips manufactures state-of-the-art X-ray equipment in terms of safety and environmental protection. Assuming no parts of the system housing are opened and assuming the system is used properly there are no risks to persons or the environment.

To comply with regulations it is necessary to use materials which may be harmful to the environment and therefore have to be disposed of in a proper manner.

For this reason you must not dispose of the X-ray equipment together with industrial or domestic waste.

Philips

- supports you in disposing of the X-ray equipment described in a proper manner
- returns reusable parts to the production cycle via certified disposal companies and
- thus helps to reduce environmental pollution.

Consequently, do contact your Philips Service Organisation in full confidence.

3 Legend

3.1 Design and functioning

The BuckyDiagnost TH2/TF series consists of the versions

- BuckyDiagnost TF with fixed table top and
- BuckyDiagnost TH2 with height-adjustable table top

Longitudinal and transverse movements of the table top are manual whilst upward and downward movements are motorized.

The table has a cassette tray which can be moved longitudinally by hand. It is braked electrically.

If the "Tomography" option is installed, the Bucky carriage has servo-assisted movement.

You can order this table with:

- Digital image receptor (TH2)
- Cassette tray
 - manual
 - with automatic cassette size sensing
 - with ACL4:
 - automatic cassette loading
 - automatic cassette size sensing
 - manual interchangeable grid
- Tracking for SID (optional)
- Tracking for the image receptor (optional)
In combination with the tomography unit, you can carry out motorized movement of the Bucky carriage into the central beam. The system collimates automatically.
- Tomography unit;
You will find the respective description in the Instructions for Use for the
 - BuckyDiagnost CS ceiling suspension unit
 - BuckyDiagnost FS floor stand.

3.2 Centre Position

In the centre position the vertical radiation beam axis points at the centre of the cassette.

- BuckyDiagnost TH2/TF:
the Bucky carriage is at the centre
- BuckyDiagnost CS:
 - longitudinal and transverse carriages are locked at the centre
 - the system is locked in place in the vertical direction when the table is at the preferred working height and the standard SID is set.
- BuckyDiagnost FS:
 - The table has a cassette tray which can be moved longitudinally by hand. It is braked electrically

- If the "Tomography" option is installed, the Bucky carriage has servo-assisted movement.

With a manual system and an oblique radiation beam axis you have to set the centre position manually; the mark on the grip of the cassette tray or on the cassette serves as a guide. A system which has the tracking function sets the standard SID automatically.

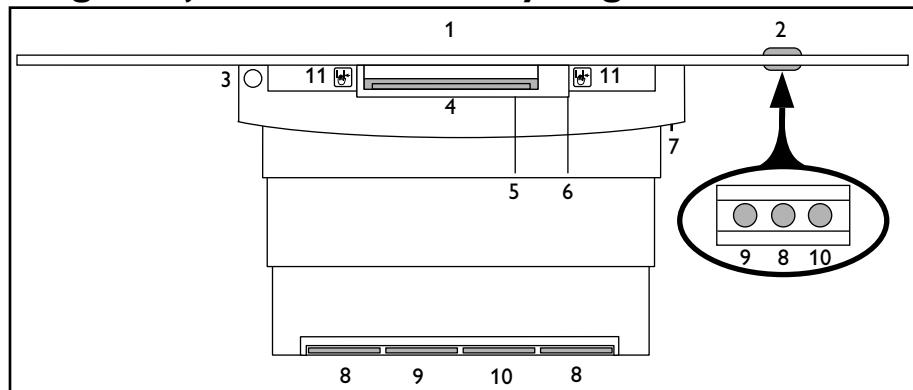
The tracking function can be ordered separately, provided that automatic cassette size sensing is installed.

Automatic cassette size sensing and the tomography unit cannot be ordered separately.

3.3 Table

3.3.1

Height-adjustable table BuckyDiagnost TH2



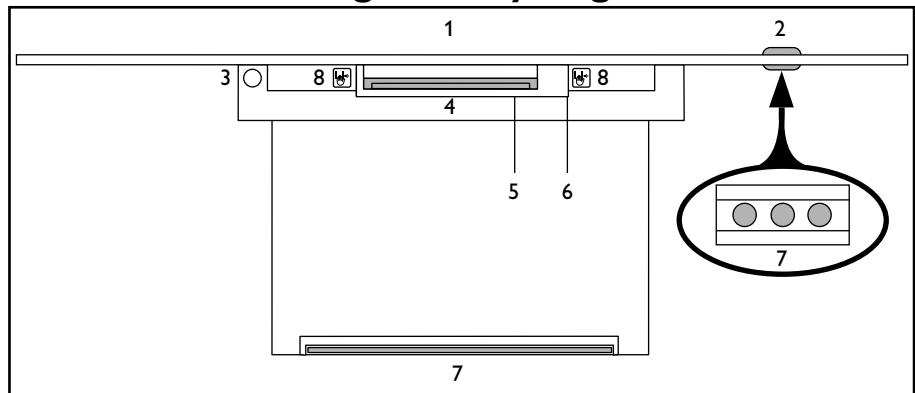
No. Description

1	"Floating" table top with rails for accessories
2	Handswitch (optional; can be installed anywhere on the rail, including the rear)
3	Disable footswitches. The button is lit when the function is selected.
4	Cassette tray (optional servo assist)
5	Brake lever for cassette tray
6	Centre indicator (optional)
7	Equipotential bonding pin
8	– Enable longitudinal and transverse movement of the "floating" table top – Switch on light field indicator
9	Lower table top (motorized)
10	Raise table top (motorized)
11	Risk of trapping fingers

You can fold up the footswitches (e.g. to clean the floor)

3.3.2

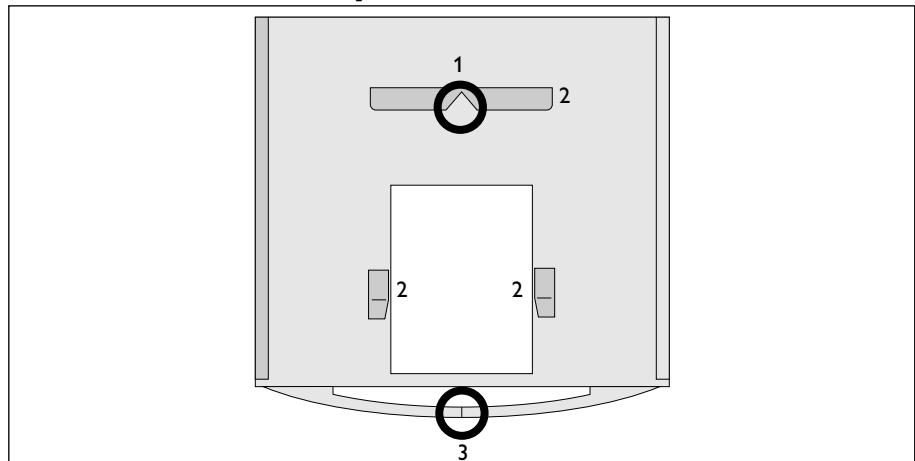
Table with fixed height BuckyDiagnost TF



No.	Description
1	"Floating" table top with rails for accessories
2	Handswitch (optional; can be installed anywhere on the rail, including the rear)
3	Disable footswitches (optional). The button is lit when the function is selected.
4	Cassette tray (optional servo assist)
5	Brake lever for cassette tray
6	Centre indicator (optional)
7	 – Enable longitudinal and transverse movement of the "floating" table top – Switch on light field indicator
8	 Risk of trapping fingers

3.3.3

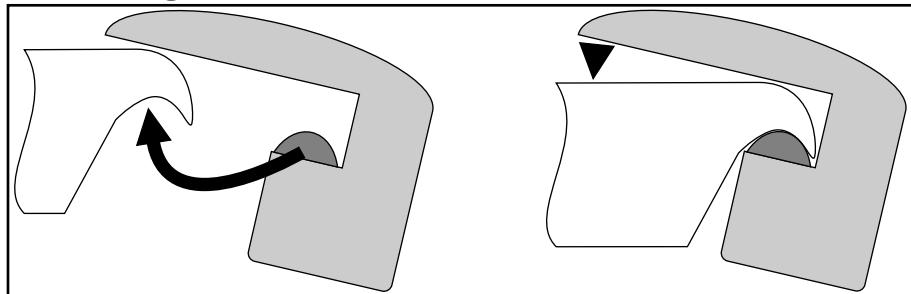
Manual cassette tray



No.	Description
1	Mark for positioning the cassette centrally
2	Cassette clamping device
3	Mark for position in relation to tube assembly

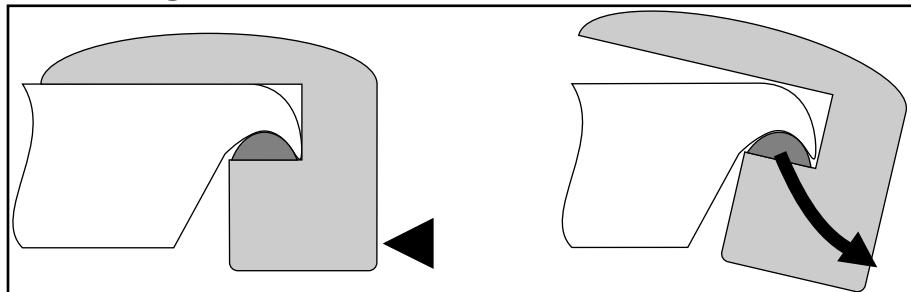
3.3.4

Attaching the handswitch



3.3.5

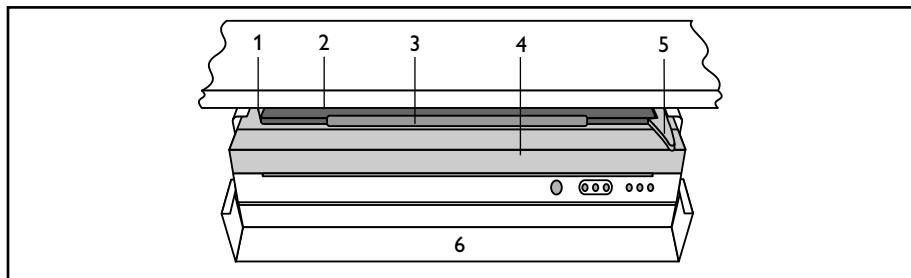
Removing the handswitch



3.3.6

Automatic cassette tray ACL4

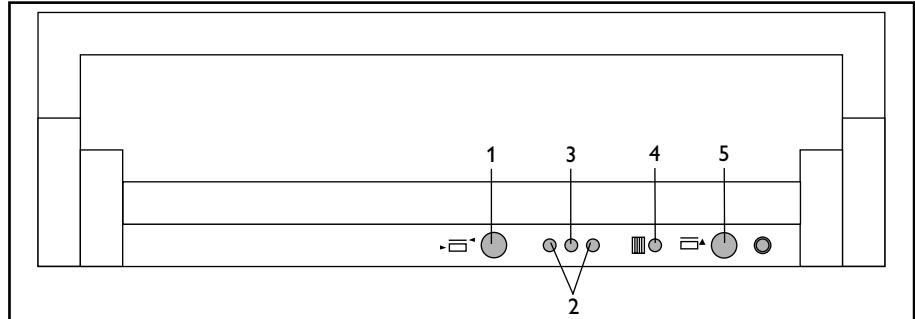
Controls



No. Description

1	Rail for grid insertion
2	Interchangeable grid
3	Colour-coded grip: Colour f_0 [cm] r Lp/cm red 110 12 36 blue 140 12 36 green 180 12 36 pink 110 8 36 yellow 110 8 36
4	Cassette carriage slit
5	Input aid and release device
6	Cover

Displays



No.	Description
1	Switch over cassette position (only on BuckyDiagnost VE/VT): Position the cassette centrally/off centre in the Bucky at the top . Select the cassette position with the cassette carriage moved out. If the cassette is already positioned, you can only move it once.
2	Yellow LED: Position cassette off centre.
3	Green LED: Cassette is positioned. – LED flashes slowly: cassette is being transported – LED flashes quickly: positioning error; remove cassette and reinsert – LED lit: cassette is positioned
4	Green LED: Interchangeable grid is fully inserted
5	Open and close cassette tray

4 Operation

The following instructions apply to the BuckyDiagnost TH2. If a particular step only applies to the BuckyDiagnost TF, this is mentioned specially.

4.1

Moving the table top



Risk of trapping fingers!

Remove all persons and objects from the range of table top movement (grey). Ensure that the patient is lying still and is not grasping the edges of the table top. If necessary, use grips, straps etc.

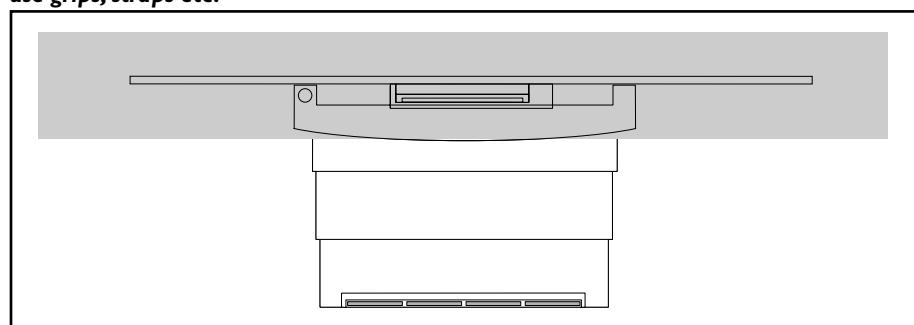
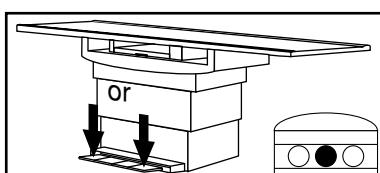


Table top downward movement stops if there is a collision. The operating point depends on the patient's weight. Upward movement is still possible. If the table top collides with the ceiling suspension unit during upward movement, the unit is moved if necessary.

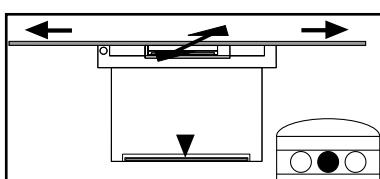
Move the table top horizontally

("floating" table top)

- at the BuckyDiagnost TH2



- at the BuckyDiagnost TF



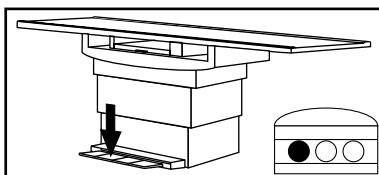
Raise the table top

Movement stops at the preferred working height (set during installation).

Continue movement:

Press the footswitch or handswitch again.

The table has a protection switch to prevent overloading. If you continuously raise and lower the table top for over 3 minutes, power will be cut off. Then you will have to wait another 20 minutes.

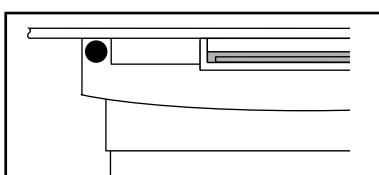


Lower the table top

The table top stops at the preferred working height.

Continue movement:

Press the footswitch or handswitch again.



Disable footswitch

The button is lit.

Enable footswitch again

Press button again.

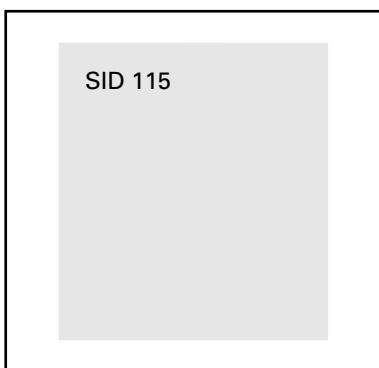
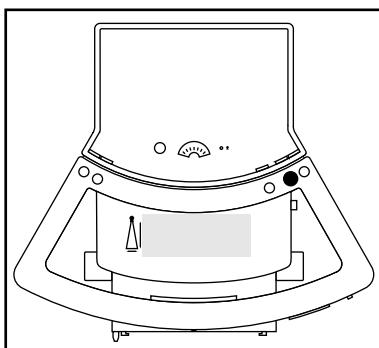
4.2

Setting SID and collimating for Bucky exposures

- 1 Insert cassette
- 2 Close cassette tray
- 3 Set radiation beam axis vertically
- 4 Raise/lower the tube assembly, if necessary

On a manual system

- 1 Read SID off the scale; the figure applies to the preferred table height
- 2 Collimate according to the table on the collimator (see the Instructions for Use for the BuckyDiagnost CS, BuckyDiagnost FS)



On a system with automatic collimation

- The SID appears on the control grip display
- The system collimates automatically (if automatic collimation is activated)

Mode display

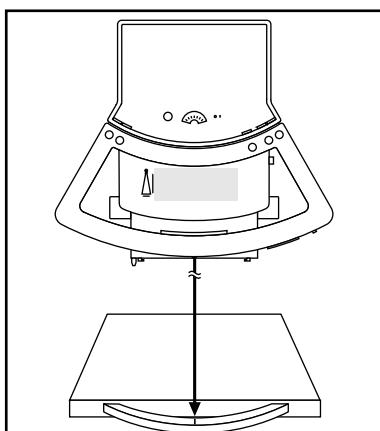
This displays the currently active mode:
"A" - automatic collimation (sensing)
"AT" - automatic collimation and tracking
"M" - manual
"MT" - manual and tracking

4.3

Centring the tube assembly on the Bucky

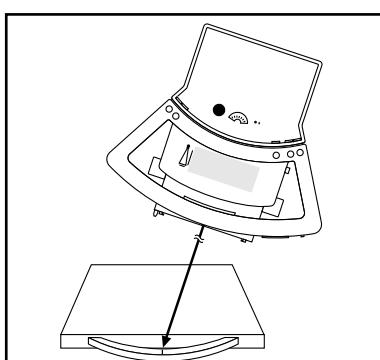


Do not look directly into the laser beam!



Centre position

- 1 Lock in tube assembly longitudinally and transversely
- 2 Set the central beam axis to vertical
- 3 Rotate the collimator so that the sides of the radiation field are parallel to the table edge
- 4 Move the Bucky carriage to the centre position



At the patient table outside the centre position

- 1 Switch on the centre laser.
- 2 Move the tube assembly longitudinally to the table top so that the centre laser is aimed at the mark on the grip of the cassette tray or at the centre indicator with the automatic Bucky (central beam axis vertical or oblique).
If the mark is concealed:
 - pull the cassette tray out of the Bucky slightly or
 - move the table top transversely

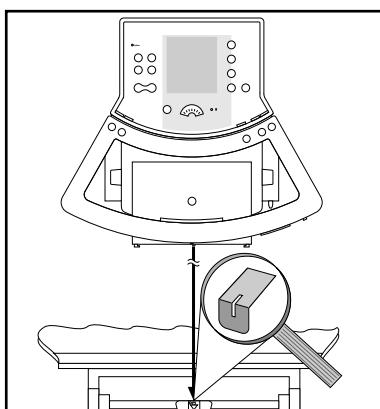
Alternatively you can move the tube assembly instead of the table top. Provided you only move it transversely, the SID will be retained.

If you wish to continue working with **automatic cassette size sensing** the centre laser must hit the image receptor vertically so that the size is collimated correctly.

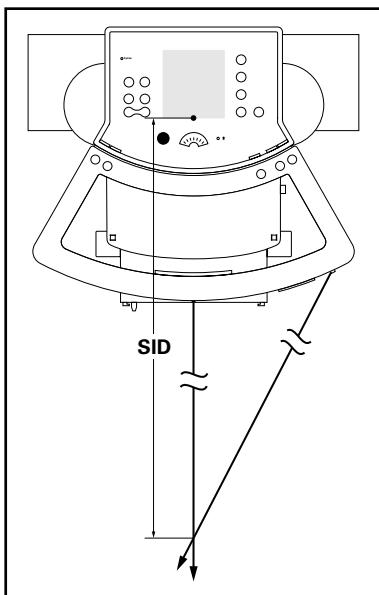
Mode display: "A"

"A" means:

- vertical central beam axis
- correctly collimated size



Setting SID for free exposure technique¹⁾ (with optional SID laser)



¹⁾ Free exposure technique:

Exposure directly on the cassette; without automatic exposure control you can use the MCS (Movable Cassette Stand) as a cassette holder.



Do not look directly into the laser beam.

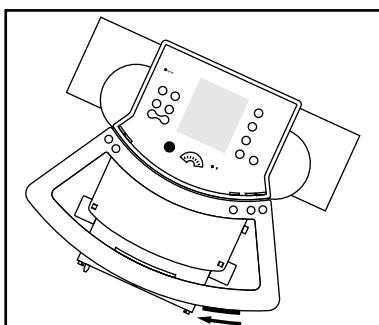
For the free exposure technique you can have a **fixed SID** set on your unit. For this purpose two laser beams, the centre laser and the SID laser (flashing), are adjusted so that the SID is defined by their point of intersection.

When making oblique beam exposures the SID laser is particularly helpful because you can set the SID at the same time as the angle. There is no need for measurement or correction.

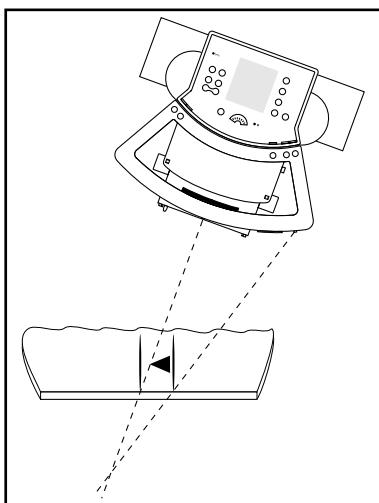
For a system with automatic collimation you must transfer the set SID to the system with the tape measure, so that the size of the radiation field can be displayed correctly.

Mode display: "M"

- 1 Switch on both lasers:
- 2 Open exits if necessary



- 3 Rotate the tube assembly to the required angle, then move it horizontally and vertically so that the two lines coincide.

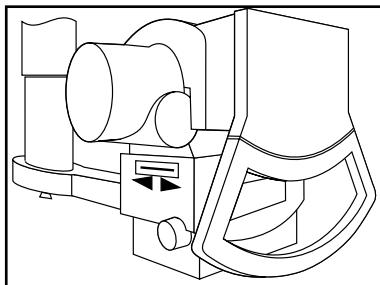


4.5

Manual collimator

If your unit has the automatic collimator, read on in Chap. 4.5.3.

4.5.1



Selecting added filters

Philips recommends:

Use an added filter to reduce radiation exposure, especially for X-ray exposures performed on children..

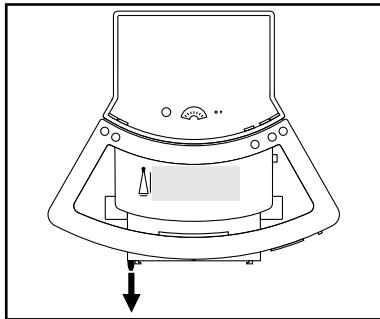
0 mm Al

2 mm Al

0.1 mm Cu + 1 mm Al

0.2 mm Cu + 1 mm Al

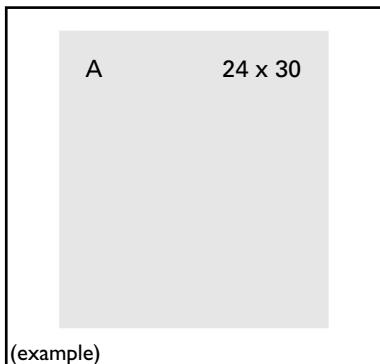
4.5.2



Measuring the SID

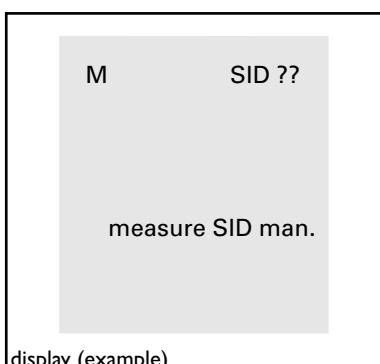
- 1 Pull out the tape measure parallel to the radiation beam axis as far as the cassette
- 2 Read off the SID

4.5.3



Automatic collimator

When the **radiation beam axis is perpendicular** to the image receptor, the system automatically collimates to the size of the cassette inserted. If you change the SID, the collimation will be adapted automatically (VE/VT lock-in positions).



When the **radiation beam axis is oblique** to the Bucky grid, the unit remains ready for exposure. You must collimate manually. Please use the tape measure (see Chap. 4.2.2). There are two possibilities:

- Starting point:
 - central beam vertical
 - cassette inserted

- 1 Swivel tube assembly
 - collimation remains (incl. any additional manual collimation)
 - system enable remains
- Starting point:
 - central beam vertical

- no cassette inserted

- 1 Swivel tube assembly
 - system collimates to 18 cm x 18 cm for the stored (last used) SID
- 2 Insert cassette;
system releases the exposure

If the unit does not detect any size, the collimator will close. For further information press .

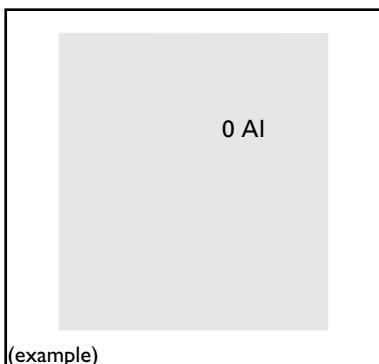
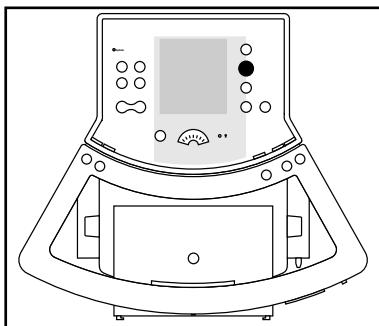
Selecting/changing an added filter

By repeatedly pressing this button you can select the added filters in the following order:

0 mm Al
2 mm Al
0.1 mm Cu + 1 mm Al
0.2 mm Cu + 1 mm Al

Philips recommends:

Use an added filter to reduce radiation exposure, especially for X-ray exposures performed on children.



With APR the system sets the programmed added filters automatically.

4.6

Cassette size sensing



Risk of trapping fingers!

Do not put your fingers in the gap between the table top and Bucky carriage



ACL4 Bucky

The cassette size is detected during cassette transport.

Manual Bucky

After inserting the cassette tray the unit recognises the size of the cassette which has been inserted.

The accuracy of size detection depends on how accurately you have centred the cassette when inserting.

For this reason Philips recommends inserting the cassette as precisely in the centre as possible.

You can use both cm-sized and inch-sized cassettes. When using both, the display is correct except in the cases indicated below.
(The difference between 24 cm and 10 inches and between 30 cm and 11 inches is only minimal. The comprise between display accuracy and insertion accuracy allows convenient working).

Cassette vertical	Display in cm	Display in inches
30 cm x 24 cm	30 x 25	11 x 10
12" x 10"	30 x 25	12 x 9.5
35 cm x 30 cm	35 x 28	14 x 11

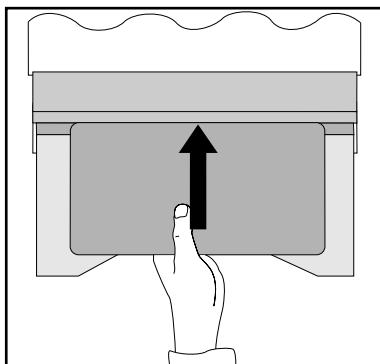
4.7

Inserting and removing a cassette

ACL4 Bucky

Inserting the cassette ...

Insert cassette fully into the cassette carriage, then let go of it.



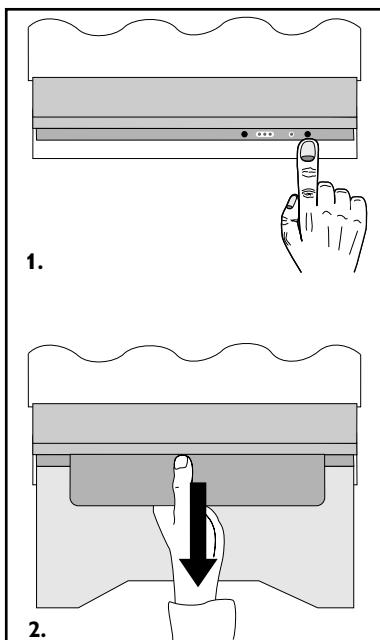
... and removing it again

Remove the exposed cassette or else there will be no system enable signal for the next exposure.

If programmed, the cassette carriage will move to the loading position for approx. 15 s after exposure so that you can conveniently remove the cassette. Then the cassette carriage moves to the exposure position again.

Lead type

The lead type is usually attached directly to the cassette using adhesive tape, according to requirement. Up to a thickness of 3 mm, there is no reason not to do this. Use a new strip of adhesive tape each time, as otherwise the lead type will become detached and fall into the electronics, which may cause serious damage to the Bucky.

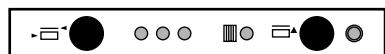


The reset function

The ACL4 always carries out a self-test and stops automatically to prevent damage if an error is detected. This may mean that you are not able to remove an exposed cassette. In this case you can reactivate the ACL4 with "Reset" and then remove the cassette – as described in the Instructions for Use.

If there is a mechanical blockage, "Reset" has no effect. You must inform Customer Service.

For "Reset", press both buttons simultaneously.

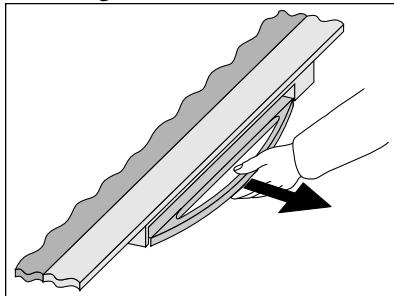


Manual Bucky

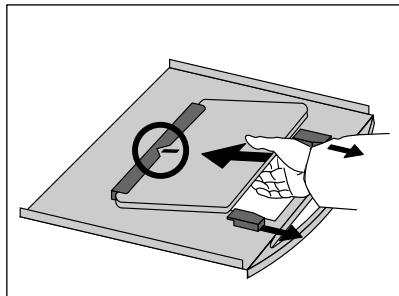


Risk of trapping fingers between cassette and cassette tray!

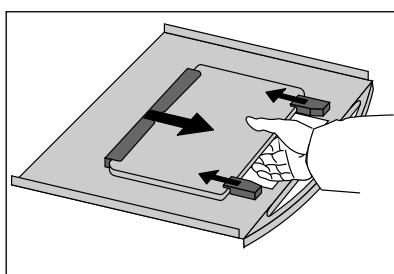
Inserting the cassette ...



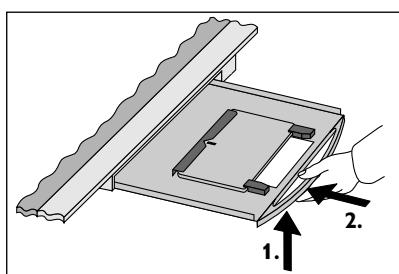
1. Pull cassette tray right out



2.

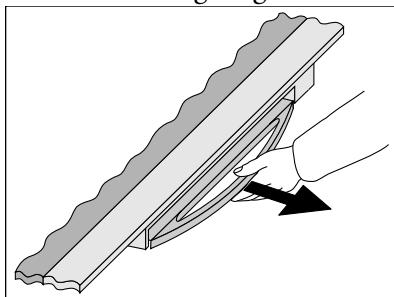


3.

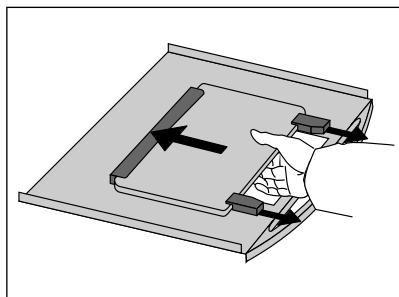


4.

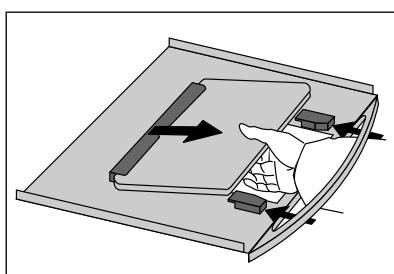
... and removing it again.



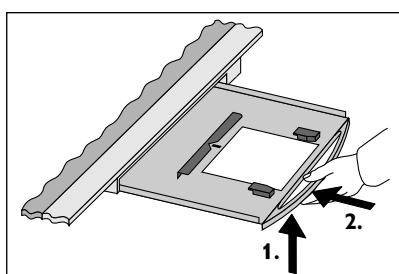
1. Pull cassette tray right out



2.



3.



4.

4.8

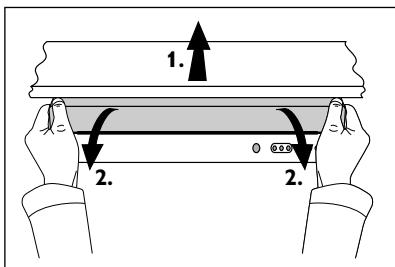
Changing the grid

ACL4 Bucky with motorized cassette loading

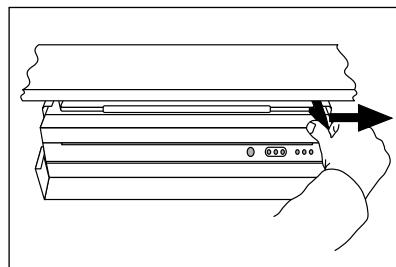


- Never leave any objects on the measuring chamber because they would be exposed on film.
- Protect the grids against damage. Even if you can insert a damaged grid, it cannot be used because bent shutters do not focus properly.

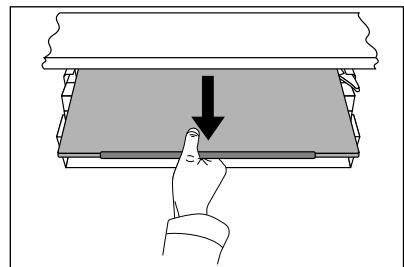
- 1 If necessary move the cassette carriage back in.



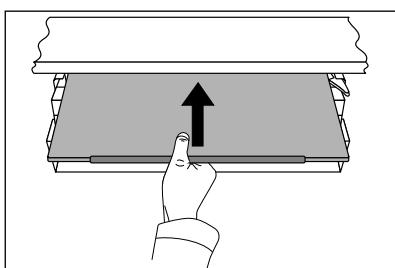
2. 1. Push the table top back
2. Open flap



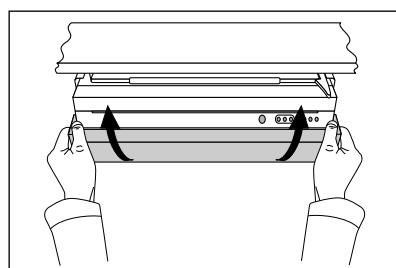
3.



4. Pull out the grid horizontally without tilting it



5. Push in the grid horizontally without tilting it until the release lever engages; for exposures without a grid close the flap immediately (Fig. 6)



6.

4.9

Setting the centre position

If you wish to set the centre position with the ACL4, you have to use the centre indicator.

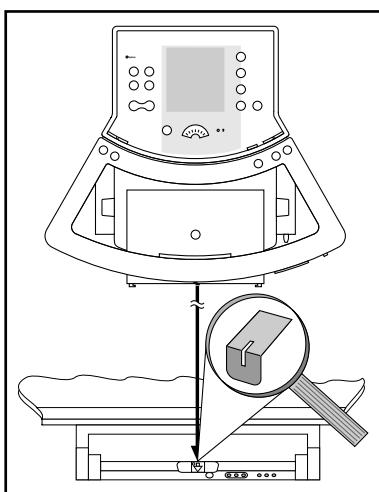
- 1 Swivel the centre indicator out of the parking position.
- 2 Pull up the brake handle and move the Bucky.



Risk of trapping fingers!

Do not put your fingers in the gap between the table top and Bucky carriage

- 3 To park the centre indicator:
Turn it aside until it is below the Bucky tray.



4.10 Tracking for the SID

(Optional, on BuckyDiagnost CS and BuckyDiagnost FS with automatic cassette size sensing)

On the BuckyDiagnost TF you can only use the tracking function on the table for setting the SID. According to its purpose, you can use the tracking function when you are working with the BuckyDiagnost VE/VT auxiliary.

What you ought to know about tracking

- The tracking function can only be activated if
 - the system components are in a defined exposure position (see Instructions for Use for the BuckyDiagnost CS),
 - the X-ray tube assembly is at 0° or 90°.
- Tracking is protected against collisions. If the tube assembly meets an obstacle, it stops when a certain force is exceeded. Then it moves back slightly.



Risk of collision and trapping fingers!

- ***Observe the position of the patient and ensure unobstructed paths for the tube assembly.***

Capture range

All the messages appear on the control grip.

- The "Tracking ready" message indicates that for the auxiliary selected you can use the tracking function but the tube assembly is still far away from the exposure position. So that you do not have to move the tube assembly to the exact exposure position manually, there is a "capture range". As soon as the tube assembly is in the capture range, it is moved to the exact exposure position automatically.
- The capture range is above and below the set SID or the level of the radiation beam axis if the beam is horizontal. You can activate the tracking function by manually moving the tube assembly into the vicinity of the SID or the level of the radiation beam axis in the case of a horizontal beam, i.e. into the capture range. If you then let go of the button to enable tube assembly movements, the tracking function is activated and moves the tube assembly to the preset SID.
- The capture range is set by Customer Service.
- Outside the capture range work is manual.
- In the case of "free" exposures with a vertical radiation beam axis you measure the focus-film (or cassette) distance with the tape measure. The tracking function then moves the tube assembly to your preferred height.

Please bear in mind that if the radiation beam axis is oblique the tracking function is switched off..

Tomography

There is a starting position for tomographic movement. The tracking device moves the centre locked tube assembly into the Tomo-SID lock-in position once.

After selecting the tomography unit, the tube assembly moves into this position. The LED for vertical lock-in is lit. You can change the table height of the BuckyDiagnost TH2 using the pedals at the table.

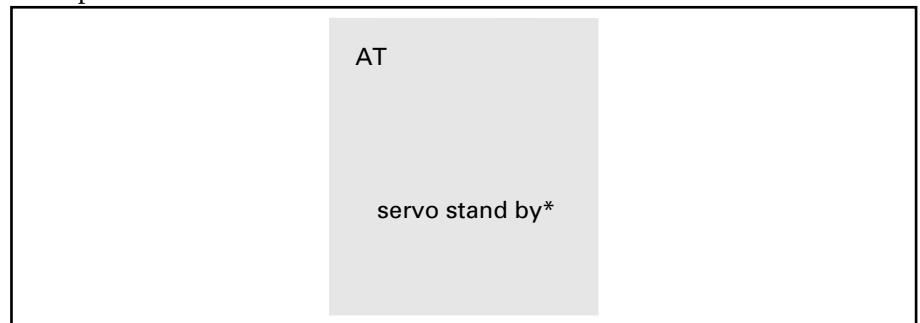
If you cannot activate the tomography unit, an appropriate message appears. You will find a list of all the possible messages in the Appendix.

Switching on tracking for the SID

You switch on the tracking by pressing a button for the AUXs twice. The following appears:

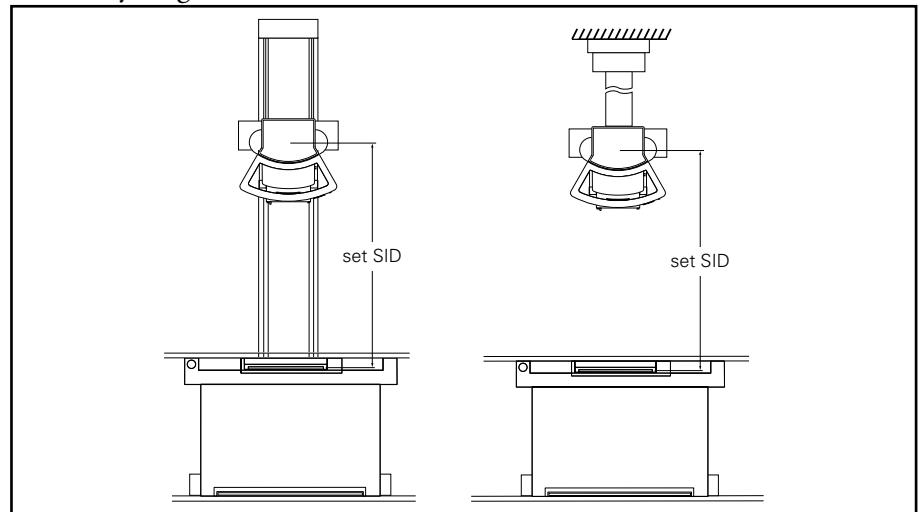
- "Servo active" or
- "Servo standby" and
- "AT".

Example:



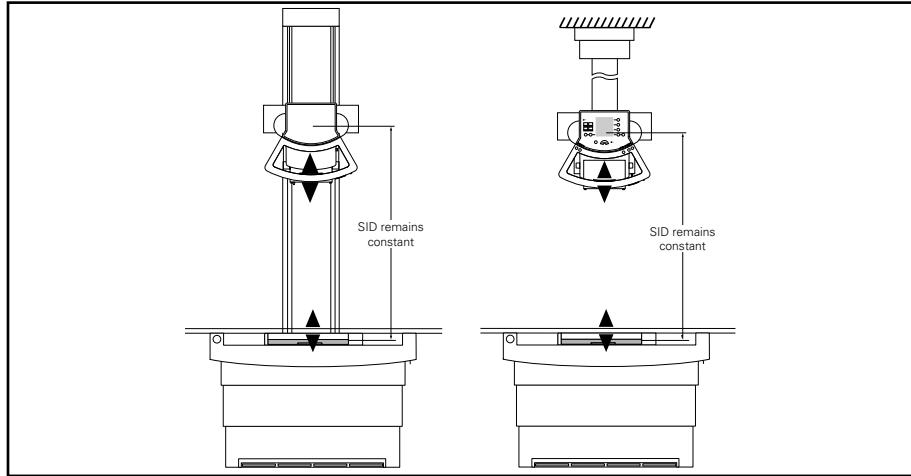
*if available in the system

On BuckyDiagnost TF



For tomography, the tracking is adapted to tomography conditions

On BuckyDiagnost TH2



”Servo active“:

- If the tube assembly is in the capture range, it moves to the exposure position.
- The tube assembly follows any adjustment to Bucky height.

”Servo stand by“:

- 1 Move the tube assembly into the capture range. You have reached it when ”Servo active“ appears.

Activating tracking

- 1 Select auxiliary at the control grip or at the generator control desk.



If you select the auxiliary at the generator control desk, the tube assembly and column may begin to move. Observe the position of the patient and ensure unobstructed paths for the tube assembly and column.

- 2 Press the button for the selected auxiliary again.
 - ”Servo active“ appears.
 - If the tube assembly was not in the exposure position, it will move to that position.
 - If tracking cannot be switched on, an appropriate message appears. You will find a list of all the possible messages in the Appendix.

Changing auxiliary

- When tracking is switched on you can change the auxiliary. Tracking remains switched on.

Switching off tracking for the SID

You can only switch off tracking when ”Servo active“ is displayed.

- 1 Press the button for the auxiliary selected. ”Servo off“ appears or raise or lower the tube assembly manually until ”Servo active“ appears.

The tracking control is automatically deactivated if the tracking is interrupted by

- releasing the central brake
- releasing the brake for ”raise/lower tube assembly“
- rotating the tube assembly around the horizontal axis.

4.11

Tracking for the image receptor

(optional, part of the "Automatic collimator" and "Tomography" combination)

The tracking for the image receptor only functions in systems with tomography and function enabled by Customer Service.

Precondition:

- After switching on, you have to move the ceiling suspension unit into the centre position (locked in longitudinally and transversely)
- The central beam axis is vertical
- The tube assembly is locked-in transversely if a grid is inserted

Operation of tracking

1 Press 

The carriage moves once with the centre of the image receptor under the central beam.

If the tube assembly is not positioned above the centre of the table the carriage moves as far as possible under the central beam. The diaphragms automatically close so far that it is impossible to expose beyond the film. If the tube assembly is positioned too far from the centre of the image receptor, the diaphragm closes completely and is no longer ready for exposure.

After pressing  "Move CS over Bucky tray" appears.

The system is only enabled when in idle state. If the image receptor meets an obstacle it comes to a standstill and "Maybe collision with Bucky tray" appears.

Automatic collimation with manual longitudinal movement of the X-ray tube assembly

- If the central beam does not hit the centre of the image receptor the system automatically collimates so that exposure beyond the image receptor size does not occur. If necessary, the shutter will be closed.

5 Maintenance

As with any technical appliance this X-ray equipment also requires

- proper operation,
- regular testing by the user,
- regular service and repair.

By taking these precautions you maintain the operability and operational reliability of the system. As the user of an X-ray unit you are obliged according to accident prevention regulations, the medical products law and other regulations to take such precautions.

Maintenance consists of **tests which the user can perform** and **maintenance** which is performed under service agreements, Philips service orders or by persons explicitly authorised to do so by Philips.

5.1 Tests by the user

The user must check the X-ray equipment for apparent defects (see table). If operational defects or other departures from normal operational behaviour occur, he must switch off the X-ray unit and inform the Service Organisation. He may only resume operation of the X-ray equipment when it has been repaired. Operation using faulty components may lead to an increased safety risk or unnecessarily high exposure to radiation.

Interval	Scope	Method
Daily	Stability test	
Daily	Faulty display lamps, damaged components, labels and warning signs	Inspection
Daily	Irregularities in the displays (flickering, failure)	Inspection
Daily	SID measurement at the automatic collimator	Inspection
Weekly	All cables and terminals (damage, breakage)	Inspection
6 months	Centring aids for X-ray tube assembly and image receptor (marks, catches, contacts)	Inspection

5.2

Safety checks according to the Medical Device Directive

The safety checks cover operability and operational reliability. They must be performed at least every 2 years. These tests constitute part of our preventive maintenance under our service agreements. They cover

- visual checking for completeness and apparent damage or defects as well as soiling, sticking parts and wear and tear which may affect safety,
- testing the necessary monitoring, safety, display and indicating systems,
- measuring the safety-relevant output parameters,
- checking electrical safety as well as the operability of an internal energy supply,
- for the particular product other special technical tests according to the generally accepted standards of engineering practice,
- other necessary tests specified by the manufacturer,
- recording results and filing the test reports in the X-ray system manual (medical products logbook).

5.3

Maintenance

X-ray units contain mechanical components such as drive chains, ropes, steel strips and gears which are subjected to wear and tear due to operation. They include means of suspension for heavy components (e.g. image intensifier, X-ray tube assembly etc.). After a lengthy period of operation the safety of the suspension may be impaired by wear and tear (e.g. rope break).

The correct setting of the electromechanical and electronic assemblies affects the functioning, image quality, electrical safety and exposure of the patient and medical personnel to radiation.

Philips recommends you to

- perform the tests indicated in the table on a regular basis,
- have the X-ray unit serviced by the Philips Service Organisation at least once a year. You must have heavily used X-ray equipment subjected to maintenance more frequently.

In this way you avoid endangering the patient and you meet your obligations.

By entering into a service agreement with Philips you retain the value and safety of your X-ray equipment. All the necessary maintenance, including the safety tests for the purpose of preventive avoidance of danger and the necessary settings for optimum image quality and minimum exposure to radiation, are performed at regular intervals. Philips agrees on these intervals with you, taking the legal requirements into account.



Faulty components which affect the safety of the X-ray equipment must be replaced by genuine spare parts.

5.4 Recording results

Service and repairs must be entered in the medical products logbook, including the following data:

- type and scope of work,
- if necessary, details of any changes to ratings or the working zone, date, person performing the work, signature.

5.5 Cleaning

Please bear the following in mind when choosing a detergent:

To clean plastic surfaces you must never use anything other than soap and water. If other detergents are used (e.g. with a high alcohol content) the material will become matt or tend to crack. Never use any corrosive, solvent or abrasive detergents or polishes.

When cleaning, please observe the following:

- Before cleaning the X-ray equipment switch off at the mains. The capacitor may still be live 4 hours after switching off.
- Ensure that no water or other liquids can enter the X-ray equipment. This precaution prevents electrical short-circuits and corrosion forming on components.
- You should wipe enameled parts and aluminium surfaces only with a damp cloth and mild detergent and then rub with a dry woollen cloth.
- Rub down chrome parts with a dry woollen cloth only.

5.6 Disinfection

The method of disinfection used must conform to the legal regulations and guidelines regarding disinfection and explosion protection.

Never use any corrosive, solvent or abrasive detergents or polishes.



If you use disinfectants which form explosive mixtures of gases, these must first have evaporated before you switch the X-ray equipment on again.

- Before disinfecting the X-ray equipment switch off at the mains.
- You may disinfect all parts of the X-ray equipment, including the accessories and connecting cables, by wiping only.
- Disinfection by spraying is not to be recommended because the disinfectant may enter the X-ray equipment.

If you perform a room disinfection with an atomizer, you must switch off the X-ray equipment first. When the X-ray equipment has cooled down, cover it over carefully with a plastic sheet. When the mist of disinfectant has subsided you can remove the plastic sheets and disinfect the X-ray equipment by wiping.

6 Technical data

Power supply only table BuckyD.TH2	Voltage: 230 V +10%/-15%, 50 Hz/60 Hz ± 2 Hz Power consumption: ≤ 6 A
only table BuckyD.TF	Power consumption: ≤ 0.3 A, with ACL4: ≤ 0.6 A
Table top incl. profile rails	240 cm x 75 cm 240 cm x 85 cm (optional) 200 cm x 75 cm (optional)
Load-bearing capacity	210 kg irrespective of the position of the patient
Attenuation equivalent	<0.75 mm Al equivalent
Film-table top distance	Manual cassette tray: 6.5 cm or with cassette size sensing ACL4: 5.6 cm
Vertical adjustment of table top (BuckyD.TH2)	51.5 cm ... 91.5 cm; the preferred height can be set by Customer Service between 70 cm and 80 cm
Table top movement	Transverse, 75 cm wide: 26 cm (± 13 cm) Transverse, 85 cm wide: 36 cm (± 18 cm) Longitudinal: 120 cm (± 60 cm)
Bucky carriage movement	manual/cassette size sensing: ± 20 cm ACL4: ± 22.5 cm
Equipotential bonding pin (BuckyDiagnostTH2)	This pin is used when connecting up other equipment if the latter requires equipotential bonding for medical reasons.
Weight	≤ 260 kg
Inherent filtration to IEC 60522/1999	Tube assembly: 2.5 mm Al at 75 kV Collimator: 0.3 mm Al equivalent at 80 kV Filter value: refer to maker's plate of the collimator

Cassette sizes [cm/inch]

with manual cassette transport	with motorized cassette transport
13 x 18 / 5 x 7 _____ / 6.5 x 8.5	
18 x 24 / _____	18 x 24 / _____
18 x 43 / 7 x 17 _____ / 8 x 10	18 x 43 / 7 x 17 _____ / 8 x 10
20 x 40 / _____	20 x 40 / _____
24 x 24 / 9.5 x 9.5	24 x 24 / 9.5 x 9.5
24 x 30 / _____ _____ / 10 x 12	24 x 30 / _____ _____ / 10 x 12
_____ / 11 x 14	_____ / 11 x 14
30 x 30 / 12 x 12	30 x 30 / 12 x 12
30 x 35 / _____	30 x 35 / _____
30 x 40 / _____	30 x 40 / _____
35 x 35 / 14 x 14	35 x 35 / 14 x 14
35 x 43 / 14 x 17	35 x 43 / 14 x 17
40 x 40 / _____	40 x 40 / _____

Accessories

- Second table control desk
- Set of patient grips
- Various lateral cassette holders
- Various accessories for fixing the patient
- Infusion bottle holder
- Wide table top
- Short table top
- Various grids in combination with motorized cassette transport

For further accessories and information about attaching and removing them, refer to the instructions in "Radiographic Accessories".

Compatibility

Tables

- BuckyDiagnost TH2
- BuckyDiagnost TF

Generators

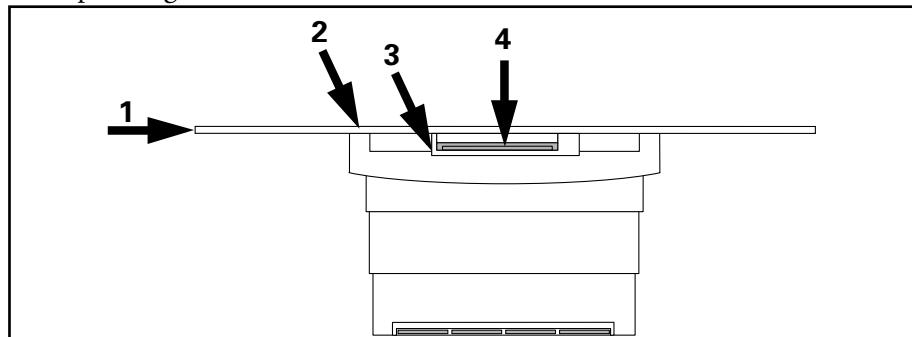
- Optimus
- MEDIO
- SCP versions

System options

- Bucky
 - manual
 - motorized cassette transport with interchangeable grids
- Cassette size sensing in combination with automatic collimation
- Tracking in combination with automatic collimation
- Tomography in combination with BuckyDiagnost CS2, CS4 or BuckyDiagnost FS S and the Optimus 50/65/80 generator
- Upgrading to DigitalDiagnost

Labels

The system is put together according to the customer's requirements, so the labels shown are only samples. Country-specific labels are only shown in the corresponding Instructions for Use.



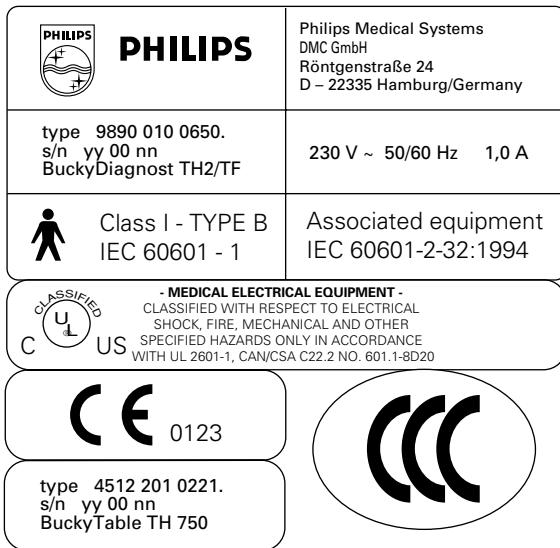
1

 PHILIPS	Philips Medical Systems DMC GmbH Röntgenstrasse 24 22335 Hamburg/Germany
type 9890 010 8378. s/n yy 00 nnn Tabletop	This Product complies with theDHHS requirements of 21 CFR Sub-Chapter J. Manufactured: month yyyy

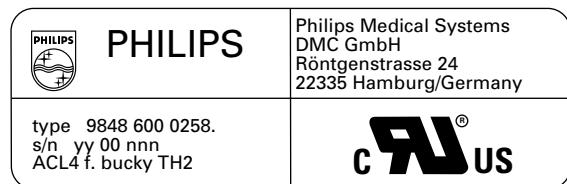
2

 PHILIPS	Philips Medical Systems DMC GmbH Röntgenstraße 24 D – 22335 Hamburg/Germany
type 9890 010 0650. s/n yy 00 nn BuckyDiagnost TH2/TF	230 V ~ 50/60 Hz 4,5 A
 Class I - TYPE B IEC 60601 - 1	Associated equipment IEC 60601-2-32:1994
 - MEDICAL ELECTRICAL EQUIPMENT - CLASSIFIED WITH RESPECT TO ELECTRICAL SHOCK, FIRE, MECHANICAL AND OTHER SPECIFIED HAZARDS ONLY IN ACCORDANCE WITH UL 2601-1, CAN/CSA C22.2 NO. 601.1-8D20	
	
Digital Prepared	
type 4512 201 0221. s/n yy 00 nn BuckyTable TH 750	

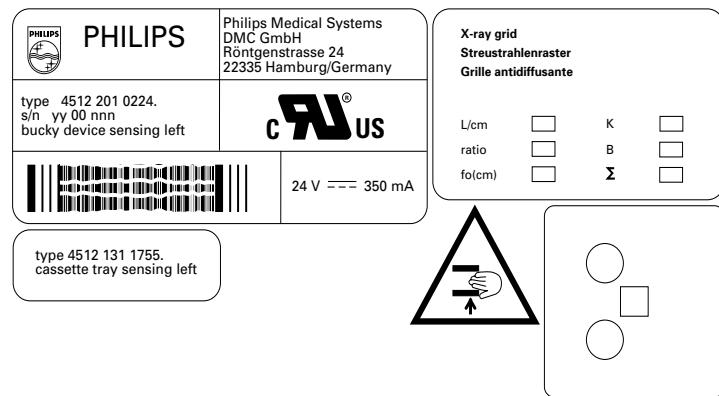
or



3



4



7 Appendix

7.1 Messages

- Messages in conjunction with the telephone symbol are only for Customer Service (except for operation with key-operated switch). Please note down these messages for Customer Service.
- Messages according to BuckyDiagnost CS2/4 have not been changes in the control grip display. At the floor stand BuckyDiagnost FS the abbreviation "CS" means "floor stand" resp. "tube assembly".

Component	Message	Remarks
General	This aux. unit is not available	Chose another auxiliary
	Grid was not released	Error in the Bucky grid, reinsert cassette, if necessary call Customer Service
	Insert cassette	—
	Insert cassette again	—
	The cassette is already exposed	Insert unexposed cassette
	SID too small	Raise tube assembly
	No Bucky servo	Motorised drive of the image receptor carriage has failed, call Customer Service
Tracking	Insert cassette centric	—
	Servo active	—
	Wallstand tilted	Set cassette tray to 0° or 90°
	Tube not at 0°	Set central beam axis vertical
	Tube not at 90°	Set central beam axis horizontal
	SID too small	Measure SID again, zoom, if necessary
	CS at limit	The tracking range of movement is smaller than the manual range of movement; move column out of the boundary area.
	Servo stand by	Move tube assembly into the capture range
	Press button again to servo	Select auxiliary again
	Servo off	Select auxiliary
Bucky	No servo for this device	—
	Servo not ready please wait	—
	Servo active please wait	—

Component	Message	Remarks
Tracking image receptor	Maybe collision with Bucky tray	Image receptor carriage is obstructed in continued running, remove obstruction
	Bucky is moving please wait	Wait until the end of the movement
	Move CS over Bucky tray	Move the tube assembly over the image receptor
	Grid exposure CS trans not locked	Move tube assembly to the image centre
	Press test for reference run	System is not ready for tracking image receptor Move tube assembly and image receptor to centre position
	Invalid cassette	Use a larger cassette size
	Tomo defect 	—
	Check field size	—
Key-operated switch	Restricted use	Manual operation, call Customer Service
Wall Bucky	Cassette still in the table	Remove (second) cassette from the table
	Bucky unit not at fixed position	Locate table top horizontally or vertically
	Lock CS in long. direction	Movement in the fixed mounted rails
	Lock CS in trans. direction	Movement in the ceiling suspension unit
	No wall cassette	Insert cassette
	Move CS over WS	Move tube assembly centrally over the table top

Component	Message	Remarks
Tomographic unit	No exp. release from generator	Release ready for exposure
	Exposure aborted at the generator	See Instructions for Use for the generator
	Press test for reference run	Demonstrate the tomographic movement to the patient
	Center floor stand in long. direction	Movement in the fixed mounted rails
	Center floor stand in trans. direction	Movement in the ceiling susp. unit
	Move tube ass. into SID	Movement in the telescopic tube
	Raise tube assembly	Movement in the telescopic tube
	Lower tube assembly	Movement in the telescopic tube
	Set tube assembly to 0°	Movement around the horizontal axis
	Lock CS arm hor. rotation	Turn the tube assembly round the stand so that its longitudinal axis points in the same direction as the longitudinal direction of the table
	Raise table top	–
	Lower table top	–
	Gen. preparation signalled	–
	CS long is still unlocked	Engage the floor stand in the longitudinal direction
	Preparation tomo please wait	–
	Tomo active in the other room	–
	Aux. unit changed at the generator	Wait until tomography is released During tomography the auxiliary has been changed at the generator control desk; repeat exposure
	Table top brakes released	During tomography the table top has been moved; repeat exposure
	Tomo run aborted at the generator	–
	Bucky drive is defect	Call Customer Service
Bucky table	Cassette still in the wall stand	Remove (second) cassette from the wall Bucky
Automatic Bucky tray	Insert grid	APR programme with grid selected
	Remove grid	APR programme without grid selected
	False APR set	APR record does not match Bucky, call Customer Service
Combination tube assembly with AUX 5...8	Select aux. unit at the generator	Control grip operates AUXs 1 ... 4
Manual operation with automatic format sensing	Measure SID man.	Use tape measure
Automatic format sensing/ NICOL	SID too small	The film size used is not illuminated
	Enlarge long. field size	Pair of diaphragms longitudinally closed
	Enlarge lat. field size	Pair of diaphragms laterally closed
	Limit coll-light use	Allow the light beam lamp to cool

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